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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

BERNATZ, KEVIN M

ART UNIT

PAPER NUMBER

1773

DATE MAILED: 02/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/976,767

Applicant(s)

MAEDA ET AL.

Examiner

Kevin M Bernatz

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 8 is/are allowed.
- 6) ☒ Claim(s) 1 and 4-7 is/are rejected.
- 7) ☒ Claim(s) 2 and 3 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ 6) ☐ Other: ____

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DETAILED ACTION

Response to Amendment

1. Amendments to claims 1, 7 and 8, filed on December 8, 2003, have been entered in the above-identified application.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Examiner's Comments

3. The limitation "recording layer" in claims 1, 7 and 8 has been given the broadest reasonable interpretation in view of the as-filed disclosure. Specifically, the Examiner notes that one of ordinary skill in the art would recognize that soft magnetic "keeper" layers are distinguished from typical magnetic "recording layers", which are hard magnetic alloys possessing relatively high coercivity values (*applicants' specification, page 8*).

Request for Continued Examination

4. The Request for Continued Examination (RCE) under 37 CFR 1.53 (d) filed on December 8, 2003 is acceptable and a RCE has been established. An action on the RCE follows.

Claim Objections

5. Claims 2 and 3 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 4 and 5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Base claim 1 recites that the perpendicular magnetic film is directly deposited on the in-plane magnetic film, yet claim 4 recites a non-magnetic spacer film being located between the two "directly deposited" films. This is inconsistent since two films directly deposited upon each other explicitly excludes other layers from being present between them. For purposes of evaluating the prior art, the Examiner has interpreted claim 4 as per the language recited in claim 8 – "said nonmagnetic spacer layer having a first surface ... makes direct contact with said perpendicular magnetic film at said second surface".

Claim Rejections - 35 USC § 103

8. Claims 1 and 4 – 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshikawa et al. (U.S. Patent No. 6,274,233 B1) in view of Ejiri et al. (U.S. Patent App. No. 2002/0068197 A1).

Regarding claims 1 and 7, Yoshikawa et al. disclose a magnetic recording medium comprising a substrate (*Figure 1, element 1*), a recording layer formed of an in-plane magnetic film (*layer 3*) being formed on said substrate and having a magnetization easy axis in an in-plane direction (*col. 2, lines 4 – 16*), and a perpendicular magnetic film (*layer 6*) directly deposited on said in-plane magnetic film (***first embodiment – col. 2, lines 4 – 16***), the perpendicular magnetic film having a magnetization easy axis oriented in a direction perpendicular to said magnetization easy axis of said in-plane magnetic film (*ibid*).

Yoshikawa et al. fail to disclose controlling the tBr of the perpendicular magnetic film to be one-fifth the tBr of the in-plane magnetic film.

However, Ejiri et al. teach the concept that in a dual magnetic film, wherein one magnetic film possesses an anisotropy crossing at right angle to the other (*Paragraphs 0008 and 0074*), the lower magnetic film can be used to record servo-tracking information and should possess an extremely large Br, and hence tBr, value (*Paragraphs 0020 – 0022 and Table 1*). The Examiner notes that the reported tBr values for the servo-tracking layer in Ejiri et al. are at least 460 G μ m. The tBr values of the perpendicular magnetic films of Yoshikawa et al. are not reported, but the Examiner notes that the compositions are comparable to the in-plane magnetic film compositions

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which possess tBr values ~50-100 G μ m. In addition, the perpendicular magnetic films possess a relatively small thickness ($\sim 300 \text{ \AA} = 0.03 \mu\text{m}$).

Given that Ejiri et al. explicitly teaches that the servo-tracking layer should possess an extremely high Br, and hence tBr, and the fact that Yoshikawa et al. desires a relatively thin perpendicular magnetic layer, the Examiner deems that it would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the device of Yoshikawa et al. to produce a lower in-plane magnetic layer possessing a tBr value much larger than the tBr value of the perpendicular layer as taught by Ejiri et al. in order to utilize the lower layer to record servo-tracking information without interference from the perpendicular magnetic film.

The relative magnitude of the two values are deemed a results effective variable in terms of the output of the servo tracking layer (*Ejiri et al.*, Paragraph 0020).

Therefore, the Examiner deems that it would have been obvious to one having ordinary skill in the art to determine an amount of each tBr value by optimizing the results effective variable through routine experimentation. *In re Boesch*, 205 USPQ 215 (CCPA 1980); *In re Geisler*, 116 F. 3d 1465, 43 USPQ2d 1362, 1365 (Fed. Cir. 1997); *In re Aller*, 220 F.2d, 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Regarding claims 4 and 5, Yoshikawa et al. disclose that the preferred embodiment possesses a non-magnetic spacer layer (*layers 4 and 5*) between the two magnetic films meeting applicants' claimed thickness limitation (*col. 2, lines 21-26 and 45 – 46; and Examples*).

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Regarding claim 6, Yoshikawa et al. disclose perpendicular alloys meeting applicants' claimed material limitations (*col. 3, lines 6 – 9 and Examples*).

Allowable Subject Matter

9. The following is a statement of reasons for the indication of allowable subject matter: claims 2, 3 and 8 are deemed allowable over the prior art of record since the prior art of record fails to teach or render obvious a dual layered recording medium meeting applicants' claimed anisotropy limitations in addition to possessing either a perpendicular magnetic film possessing a thickness not exceeding 5 nm at the maximum (*claims 2 and 8*) or the relative Hk values meeting applicants' claimed limitations (*claim 3*).

Response to Arguments

10. The rejection of claims 1, 3, 6 and 7 under 35 U.S.C § 103(a) – Ando et al.
The rejection of claims 1 - 3, 6 and 7 under 35 U.S.C § 103(a) – Futamoto et al.

The rejection of claims 1 and 3 - 8 under 35 U.S.C § 103(a) – Kawato et al.,
either alone or in view of Shimizu et al.

Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

The above noted rejection has been withdrawn because applicant(s)
amendment(s) have set forth new limitations (e.g. the two magnetic layers being directly

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deposited upon each other in a specific order above the substrate) no longer anticipated, nor rendered obvious, by the above noted rejection.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M Bernatz whose telephone number is (571) 272-1505. The examiner can normally be reached on M-F, 9:00 AM - 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Thibodeau can be reached on (571) 272-1516. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Kevin M. Bernatz
Patent Examiner

February 5, 2004